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Fifth- and sixth-grade students were trained by kindergarten teachers to tutor kindergarten pupils in reading by using highly structured practice exercises, selected by teachers for each pupil as part of the Southwest Regional Laboratory's First-Year Communication Skills Program. To measure the effectiveness of tutoring on the progress of pupils needing remedial reading instruction, postremediation performances of pupils receiving teacher-plus-tutor remedial instruction and of pupils receiving only teacher remedial instruction were compared in eight schools. Pupils who were tutored scored significantly higher on the postremediation tests, and pupils who were reading close to the acceptable level on initial tests were helped more by teacher-plus-tutor instruction than by a teacher alone (possibly because a teacher without a tutor must concentrate on the most deficient pupils). In addition, tutored pupils outperformed untutored pupils on a mid-term test on 14 out of 15 items. Modifications have been made in the tutoring program on the basis of finding that some pupils were not receiving all of the practice exercises and that tutors needed more training in certain skills. A final report will contain detailed accounts of tutor training procedures and program installation procedures as well as final pupil reports. (LP)

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THE SWRL TUTORIAL PROGRAM: A PROGRESS REPORT

Fred C. Niedermeyer and Patricia Ellis

During 1968-69 the Southwest Regional Laboratory for Educational Research and Development (SWRL) developed an exportable tutorial program whereby school personnel train fifth- and sixth-grade students to tutor kindergarten children in reading. The purposes of this progress report are (1) to present the rationale used to formulate the tutorial program, (2) to sketch the initial development of the program, (3) to describe the tutorial program in its present form, (4) to present pupil performance data to indicate the effectiveness of the program, and (5) to discuss planned revisions to improve the program.

RATIONALE FOR THE TUTORIAL PROGRAM

The SWRL Tutorial Program was formulated according to the following rationale:

- When the learning tasks require a great deal of practice, then non-professionals (in this case fifth- and sixth-grade tutors) can be effective.

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- Tutors are able to maintain and strengthen learning initially acquired from the classroom teacher by monitoring practice responses of individual pupils and administering verbal praise.[1]

- Materials used by the tutors with their pupils should be highly structured and tied directly to specified pupil behaviors.

- An efficient system for prescribing tutorial instruction and for managing logistical requirements should be devised.

INITIAL DEVELOPMENT OF THE TUTORIAL PROGRAM

Initially, objectives were written specifying what tutors should do when tutoring. These objectives were then refined by working with four fifth-grade students and a pool of kindergarten pupils in Garden Grove during the summer of 1968. Briefly, these objectives evolved:

1. Tutor engages pupil in non-instructional, friendly conversation.

2. Tutor verbally confirms correct pupil responses.

3. Tutor praises the pupil.

4. Tutor tells or shows the pupil the correct response when the pupil is incorrect.

5. Tutor, after displaying Behavior 4, then elicits correct response from pupil before going on.

6. Tutor, following non-response to his initial question or direction, repeats it using different words.

7. Tutor avoids attempting to elicit correct response by prompting.

8. Tutor avoids negative verbal behavior, e.g., "No, that's wrong."

By October these materials and procedures had been incorporated with the objectives, and the resulting program was installed at four elementary schools in Torrance. Using a Tutor Training Manual and

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[1] See "Training Effects on the Instructional Behaviors of Student Tutors," Fred C. Niedermeyer, SWRL Research Memorandum, March 20, 1969.

related materials, nine kindergarten teachers at these schools trained about 75 fifth- and sixth-grade tutors. These students left their classes three times a week to monitor 20-minute practice sessions in the Kindergartens. Tutors used highly structured materials (called Practice Exercises) specifically prescribed for each kindergarten pupil on the basis of his performance in the SWRL reading program.

SWRL reading program

SWRL's First-Year Communication Skills Program is designed to teach kindergarten children basic reading skills. Following initial teacher instruction (about 3 weeks) in each of 10 program Units during the year, the kindergarten pupils are tested on four Outcomes. These Outcomes are: (1) reading program words, (2) reading specified beginning sounds, (3) reading specified ending sounds, and (4) blending previously learned beginning and ending sounds to read new (non-program) words. The 20-item test, called a Criterion Exercise, consists of five selected-response items on each of the four Outcomes. Scores are recorded on a Class Record Sheet (Figure 1). The Class Record Sheet shows which pupils need remediation on each of the four Outcomes.

Remedial materials, called Practice Exercises, are provided the teacher for use with children whose Criterion Exercise performances reveal that they have not mastered one or more outcomes for a particular Unit. A Practice Exercise (see Figure 2) consists of 20 items which call for both selected and constructed responses. At the side of the Practice Exercise is a vertically printed script to be read by the teacher (or the tutor). Eight Practice Exercises, each focusing on one of the four Outcomes, are provided for each Unit.

CLASSROOM TUTORING PROCEDURES

With the SWRL Tutorial Program, teachers are assisted in providing remedial instruction by trained intermediate-grade tutors. The teacher, having administered a Criterion Exercise to the entire class and marked the scores on a Class Record Sheet, then designates Practice Exercises for each pupil. This is accomplished by checking Tutor Assignment Cards according to the rules stated in Figure 3.

The teacher assigns tutors to individual students by placing Tutor Assignment Cards in a file box which contains the names of each available tutor. When a tutor comes to the kindergarten, he merely locates the pupil and the Practice Exercise indicated on the Tutor Assignment Card filed behind his name.

During the session, the tutor reads aloud the script on the Practice Exercise, then replies to the kindergartener's responses according to the general tutorial behaviors he has learned. After

Figure 1

CLASS RECORD SHEET

TEACHER Stephens, Elaine

SCHOOL Washington

STUDENT NAME	NUMBER CORRECT FOR EACH OUTCOME				
	OUTCOME 1 WORDS	OUTCOME 2 INITIAL SOUNDS	OUTCOME 3 ENDING SOUNDS	OUTCOME 4 BLENDS	TOTAL CORRECT
1. Joni	4	5	5	4	18
2. Victoria	3	4	5	3	15
3. Shelia	4	5	5	5	19
4. Dawn	5	3	1	4	13
5. Deborah	5	5	5	5	20
6. Christie	4	3	4	5	16
7. Melinda	2	5	4	1	12
8. Amy	5	5	5	5	20
9. Liza	5	5	5	4	19
10. Terrie	3	3	2	3	11
11. Scott	5	5	5	4	19
12. Kenneth	4	5	5	4	18
13. Philip	5	5	5	4	19
14. Daniel	4	5	5	5	19
15.					

Figure 2

Typical Page from a 5 Page Practice Exercise

Used by Tutors with Kindergarten Pupils

PRACTICE EXERCISE 1a UNIT 6			2
Row 1. Point to the word fun	1	fun	sun	feet
Row 2. Put your finger under the word run	2	sun	ran	run
Row 3. Read this word	3	Sun		
Row 4. Read this word.	4	Run		

Figure 3
EXAMPLE OF A TUTOR ASSIGNMENT CARD

TUTOR ASSIGNMENT CARD UNIT 1

STUDENT _____

☐ Mastery--20 Correct ☐ Needs Practice--Less than 20 correct. See below.

PRACTICE EXERCISES (P.E.)

Outcome 1 Words		Outcome 2 Initial Sounds		Outcome 3 Ending Sounds		Outcome 4 Blends	
___1a	___1b	___2a	___2b	___3a	___3b	___4a	___4b

STORYBOOKS

___1	___1S	___2	___2S	___3	___3S	___4	___4S
I See Sam	Sam	See	I See	Am I Sam?	I Am!	See Me	I Am Sam

RULES FOR DETERMINING WHICH PRACTICE EXERCISES (P.E.) TO CHECK:

For Each Outcome:

A. If score on Class Record Sheet is 5, then do not check a P.E. for that Outcome.

B. If score on Class Record Sheet is 4 or 3, then check the "a" P.E. for that Outcome.

C. If score on Class Record Sheet is 2, 1, or 0, then check both the "a" P.E. and the "b" P.E. for that Outcome.

completing the Practice Exercise, the tutor may be assigned to monitor the reading of a SWRL storybook or he may take the kindergartener to play. When the session is over, the tutor marks off the number of the completed Practice Exercise on the Tutor Assignment Card. At the next session, the tutor simply selects the next Practice Exercise which the teacher has checked on the Assignment Card.

EFFECTIVENESS OF THE TUTORIAL PROGRAM

The most important criterion for evaluating the tutorial program is, of course, the reading performance of the tutored kindergarten pupils. Do their reading skills noticeably increase as a result of being tutored by trained fifth and sixth graders? To answer this question, post-remediation performances of pupils in classes in which both the teacher and trained tutors provided remedial instruction were compared to classes in which the teacher provided this instruction without the assistance of trained tutors.

The sample

From eight schools in the nearby school district which participated in the 1968-69 tryout of the First-Year Communication Skills Program, four were randomly selected to use the SWRL Tutorial Program. In these four schools, remedial instruction following each Unit of the reading program was administered by the trained tutors and the teacher. Teachers in the remaining four schools provided remedial instruction using the same diagnostic means (Criterion Exercises) and materials (Practice Exercises), but without the assistance of trained tutors.

Measuring remedial learning gains

A fractional sampling method was used to measure remedial learning gains. Approximately 3 weeks after the teacher administered the Criterion Exercise for a particular Unit, a retest of the Criterion Exercise was administered by SWRL personnel to four kindergarten students in the classroom. These four children were randomly sampled from those students whose initial score on the 20-item Criterion Exercise was less than 16 (80%), i.e., they were in need of remediation. Following each of the first four Units of the reading program, retesting took place in four randomly selected teacher-plus-tutor remediation classes and four randomly selected teacher-only remediation classes. However, in some classes it was impossible to retest four remedial pupils following a Unit because all or most of the pupils had scored above the 80% level on the initial Criterion Exercise.

Results

Table 1 shows the means of all participating kindergarten pupils on each of the first four Units on both administrations of the Criterion Exercises (prior to and following remediation). The table contrasts the teacher-only and teacher-plus-tutor groups. Scores are categorized according to the initial administration: 0-5 (less than chance), 6-10 (very low), and 11-15 (low). Students who scored from 16 through 20 on the initial Criterion Exercise were not in need of remediation and their scores do not appear in the table.

Several things should be noted from Table 1. The mean initial score on the Criterion Exercise for the 39 remedial pupils from the teacher-only group was almost identical to the mean initial score for the 57 remedial pupils from the teacher-plus-tutor group (12.00 to 11.91). The mean scores on the Criterion Exercise retest following remediation, however, were 12.44 and 14.12 in favor of the teacher-plus-tutor group. These retest scores were subjected to a t-test and were found significantly different (t=7.531, $t_{(.05,\ df\ 94)}$=1.980).

Looking at the scores subdivided into three initial score categories, it can be seen that when the initial score was 11 through 15 (low but not extremely low), pupils under teacher-only remediation failed to improve on the retest. Pupils in the 11-15 category under teacher-plus-tutor remediation scored an average of 1.93 higher on the retest than on the initial Criterion Exercise. On the other hand, when the initial scores were quite low (0 through 10) pupils seemed to score higher on the retest regardless of remediation group. One possible explanation for this (besides regression) is that teachers without tutors to assist them are forced to work only with the few who are most obviously deficient. (Of the 96 pupils sampled, only 25 fell into the 0-10 range on the initial test.) Perhaps the majority of those in need of remediation (those in the 11-15 range) did not receive remediation in the teacher-only classes.

It is also interesting to look at the retest scores from the viewpoint of the goal of the remedial instruction (to bring as many pupils as possible up to the 80% criterion level). Table 2 shows the success in reaching this level of those pupils in each group whose initial scores were in the 11-15 range (close to criterion). In the teacher-plus-tutor group 21 out of 41 remedial pupils (51%) reached the 80% level on the retest, while in the teacher-only group only 6 out of 30 (20%) reached this goal.

ANOTHER CRITERION OF PROGRAM EFFECTIVENESS

A second measure of pupil performance was the Mid-Term Test given to a random sample of eight students from each of the 20 classes using the SWRL First-Year Communication Skills Program. From these 160

Table 1

Test-Re-test Gain Scores Following Teacher-Only Remediation and Teacher-Plus-Tutor Remediation

Initial Score Category	Teacher-Only Remediation				Teacher-Plus-Tutor Remediation			
	Number of Pupils	Mean Initial Score	Mean Re-test Score	Gain	Number of Pupils	Mean Initial Score	Mean Re-test Score	Gain
0-5	1	3.00	4.00	+1.00	2	4.00	10.00	+6.00
6-10	8	8.50	10.63	+2.13	14	8.50	11.00	+2.50
11-15	30	13.23	13.20	-0.03	41	13.46	15.39	+1.93
All Remedial Pupils	39	12.00	12.44	+0.44	57	11.91	14.12	+2.21

Table 2

Effectiveness of Remedial Procedures in bringing Ss in 10-15 range (50% - 75%) on initial Criterion Exercise (C.E.) up to 16 or above (80%) on Retest.

	Teacher Plus Tutor Remediation	Teacher Only Remediation	
Ss with initial C.E. score in 10-15 range who came up to 80% Criterion on Retest.	21	6	27
Ss with initial C.E. score in 10-15 range who did not come up to 80% Criterion on Retest.	20	24	44
	41	30	71

students, average Criterion Exercise scores for the first four Units were calculated. Any student whose average Criterion Exercise score was 16 or less (80%) was defined as remedial, i.e., he should have received considerable remedial instruction following each Criterion Exercise. From the total Mid-Term Test sample of 160 students, 19 were identified as remedial from the teacher-plus-tutor classes and 18 were identified as remedial from the teacher-only classes.

Table 3 shows the mean percentage scores of the 19 teacher-plus-tutor students and the 18 teacher-only students on each program outcome measured by the Mid-Term Test. This test was individually administered and consisted of 30 constructed-response items, 30 selected-response items, and 5 sentences to be read. The two graphs in Figure 4 show the mean percentage scores for each outcome displayed in Table 3.

It can be seen from the data that remedial students from the teacher-plus-tutor classes outperformed remedial students from the teacher-only classes on 14 out of the 15 outcomes. The greatest effect of teacher-plus-tutor remediation occurred on constructed-response outcomes dealing with word recognition, beginning sounds, ending sounds, and sentence reading. Little difference exists between the two groups in ability to construct responses dealing with blends (some difference appears for the blending outcome when selected responses are required, however). Outcome 5, letter-naming, was not part of the tutorial program. No remedial materials for letter-naming were developed and tutors never dealt with it. Thus no differences would be expected on this outcome between teacher-plus-tutor classes and teacher-only classes. And, indeed, there was none.

While teacher-plus-tutor pupils outperformed teacher-only pupils on the Mid-Term Test, it is important to note that the average scores for these two groups on the four Criterion Exercises leading up to the Mid-Term were identical, $\bar{X} = 13.9$ (70%). Thus it would seem that the Mid-Term differences can be attributed to differences in the remedial instruction given after each Criterion Exercise.

Results indicate that teachers using the SWRL Tutorial Program, even in its initial form, were more effective in improving pupil performance through remedial instruction than teachers not using the Tutorial Program.

PROGRAM MODIFICATIONS

Figure 5 contains two graphs which suggest that the tutorial program, though effective in its present form, could be much improved. Frequencies of various gain scores from the initial Criterion Exercise to the retest are graphed for the teacher-only pupils, and for the teacher-plus-tutor pupils, and the distribution for the teacher-plus-tutor pupils is bimodal, i.e., many pupils make quite substantial gains

Table 3

Mean Percentage Scores of 19 Randomly Sampled Teacher-Plus-Tutor Remediation Students and 18 Randomly Sampled Teacher-Only Remediation Students on Mid-Term Test[1]

Constructed Responses

OUTCOME	TEACHER PLUS TUTOR REMEDIATION	TEACHER ONLY REMEDIATION	DIFFERENCE
1. Word Reading	66	42	24
2. Initial Sounds	65	53	12
3. Ending Sounds	40	20	20
4a. Blending non-program words	26	22	4
4b. Blending non-words composed of program sounds	6	2	4
5. Letter-naming ★	52	50	2
6. Sentence reading	52*	27*	25
TOTAL	43	30	13

★ Not worked on by tutors
* Not included in total

Selected Responses

OUTCOME	TEACHER PLUS TUTOR REMEDIATION	TEACHER ONLY REMEDIATION	DIFFERENCE
1. Word Reading	85	82	3
2. Initial Sounds	83	86	-3
3. Ending Sounds	80	65	15
4a. Blending non-program words	62	46	16
4b. Blending non-words composed of program sounds	66	56	10
5. Letter-naming ★	88	84	4
TOTAL	77	70	7

★ Not worked on by tutors
1. Remedial students are those who averaged 80% or less on the first four Criterion Exercises. Mean score on first four Criterion Exercises for both groups was 70%.

Figure 4

Mid-Term
Graphs of Mean Percentage Scores Displayed in Table 3

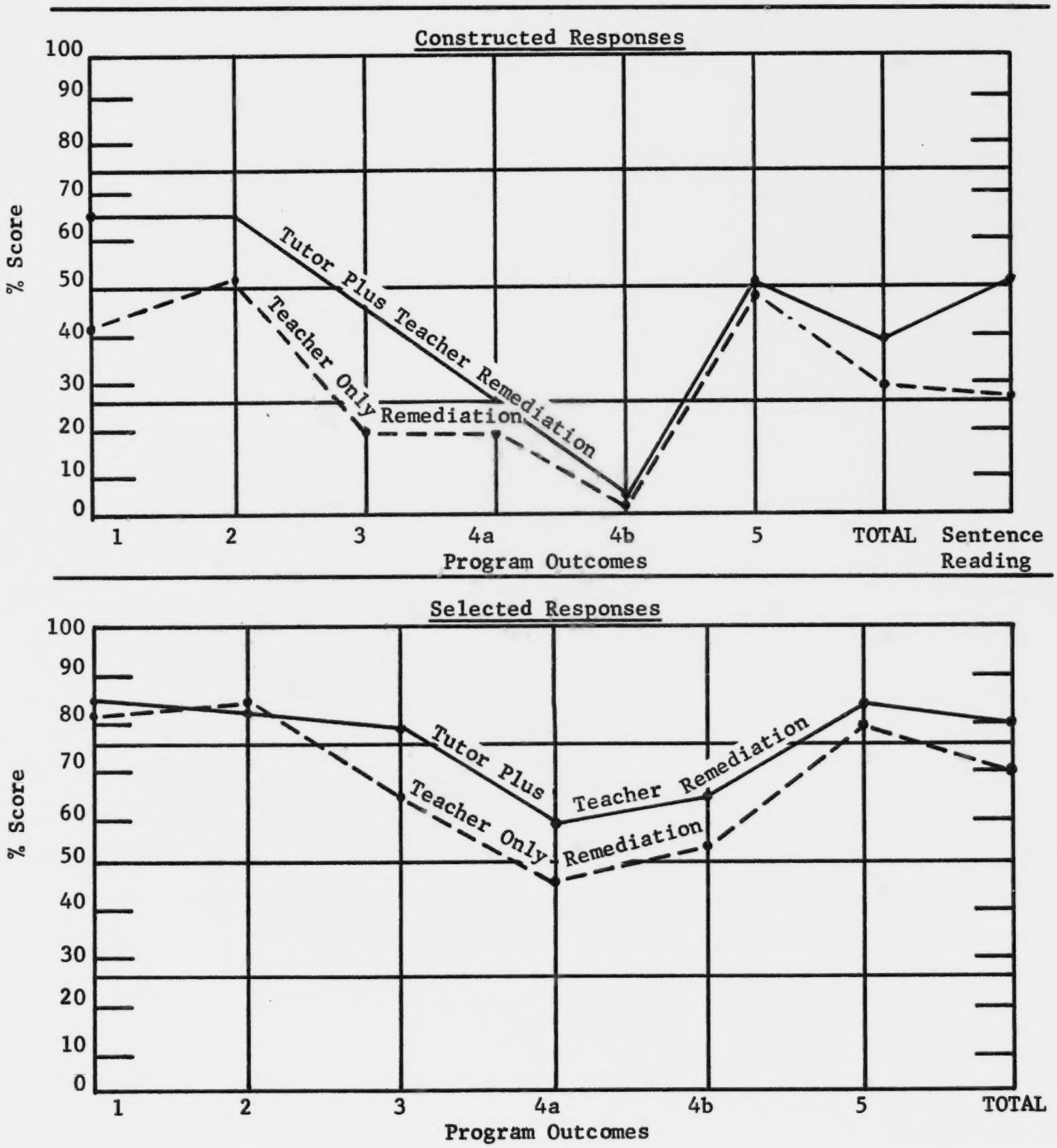
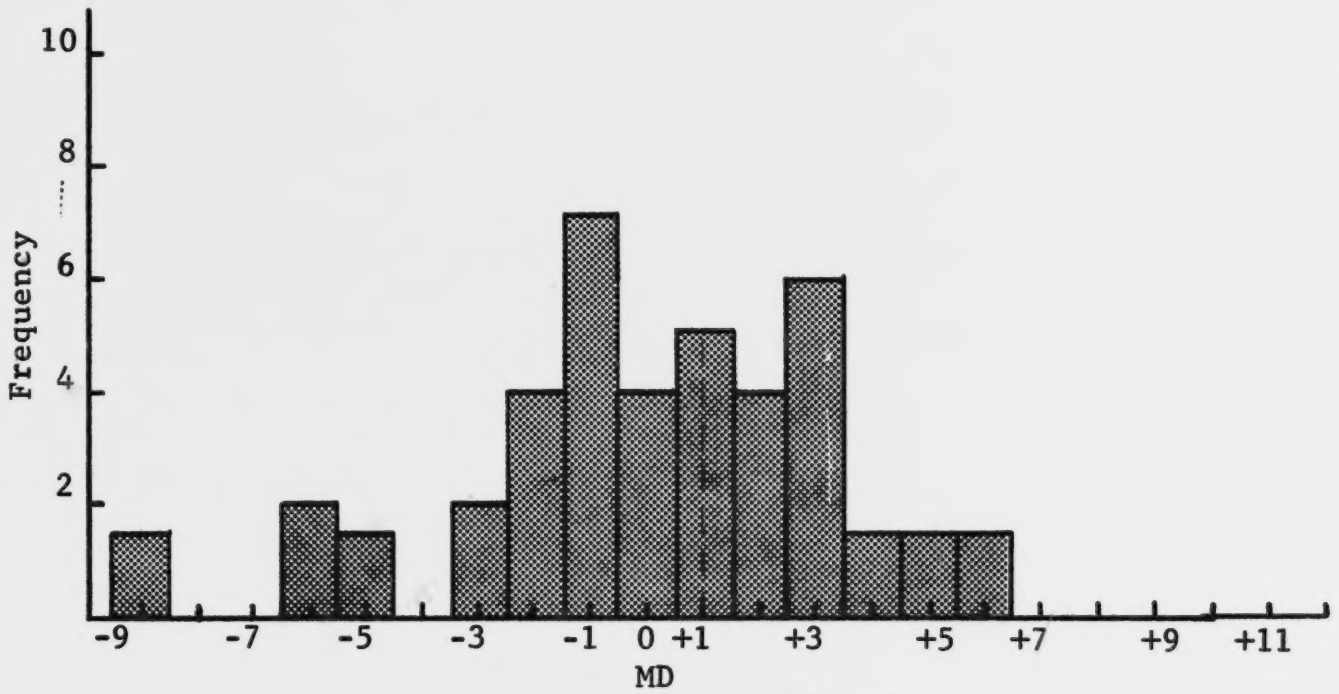
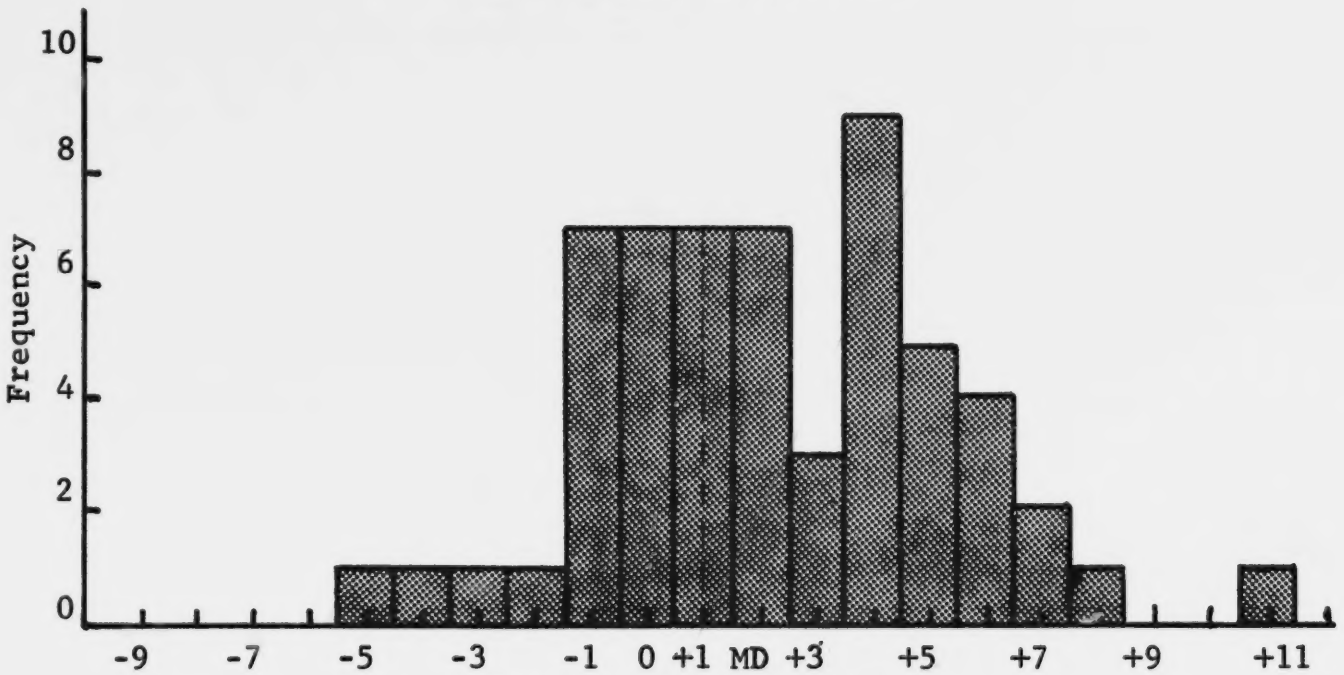


Figure 5

Test-retest gain-score frquencies for pupils under Teacher-Only Remediation and Teacher-Plus-Tutor Remediation.





(4 to 6 items) while many others show little change (-1 to +2 items). To account for this distribution, it was suggested that perhaps many pupils (those showing little test-retest change) were simply not being tutored with the prescribed Practice Exercises. It may be that the teacher was failing to frequently update the Tutor Assignment Cards and the file box.

To check this hypothesis, several modifications were introduced in two of the teacher-plus-tutor classes at one of the schools. Tutors were directed to log each tutoring session with a Tutor Record Card (see Figure 6). When using the Tutor Record Card, the tutor circles all incorrect pupil responses and checks all correct responses.

Following three weeks of tutoring on Unit 4, the two teachers were asked if sufficient time had passed to complete all tutoring sessions. The responses were positive and all pupils were then given a retest on the Criterion Exercise for Unit 4.

Table 4 contains results of the initial Criterion Exercise test, the retest following tutoring, and test-retest gain for each pupil who scored less than 80% on the initial test. Table 4 also contains, for each remedial student, the percentage of prescribed Practice Exercises for which Tutor Record Cards were actually turned in by the tutors.

It may be seen that the completion rate of assigned Practice Exercises by tutors is very low, i.e., for only one student were Record Cards turned in for all prescribed Practice Exercises, and no Record Cards at all were turned in for five students. The rank order correlation between gain scores and the percentage of completed Practice Exercises was, of course, high ($\rho = .543$, $P < .05$). Not surprisingly, those who received remedial tutoring learned more than those who did not. The problem, then, seems to be one of instructional control. How can the program be modified to insure that prescribed Practice Exercises actually are used with remedial students by tutors? Several changes designed to solve this problem were introduced into the four tutorial schools for the remainder of the school year.

Tutor Record Cards, as earlier described, are now being used by all tutors. This will allow for closer SWRL assessment of pupil performance during tutoring and, of course, will provide an accurate record of how much tutoring actually takes place.

The file box system of assigning tutors was replaced by a wall chart listing the names of all kindergarten pupils and each child's prescribed Practice Exercises. The teacher simply assigns tutors to kindergarteners by moving magnetic name plates of each available tutor. After completing each assigned Practice Exercise, tutors simply cross out its number on the wall chart. This allows the teacher to see at a glance how many of the prescribed Practice Exercises have been used by tutors. Before, the teacher had to shuffle through all of the Tutor Assignment Cards in the file box.

Figure 6

TUTOR RECORD CARD

TUTOR: _____

STUDENT: _____

PRACTICE EXERCISE: ___ UNIT: ___

DATE: _____

MARKING KEY:

✓ = right ○ = not right

TRAIL ONE

Page: 1	2	3	4	5
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4

TRAIL TWO

Page: 1	2	3	4	5
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4

Table 4

Test-Retest gains and percent of prescribed Practice Exercises actually completed for all remedial pupils in two classes for one unit.

Subject	1. Initial Criterion Exercise Score	2. Retest Following Remediation	3. Gain Score	4. Completed Practice Exercises/ Assigned Practice Exercises	5. Percent of Assigned Practice Exercises Completed
1	15	16	+1	2/3	67
2	13	16	+3	2/4	50
3	3	7	+4	0/8	0
4	11	16	+5	4/6	67
5	15	20	+5	4/4	100
6	11	17	+6	4/5	80
7	9	7	-2	0/7	0
8	12	12	0	2/5	40
9	12	20	+6	3/6	50
10	9	9	0	2/6	33
11	14	18	+4	0/5	0
12	12	2	-10	2/5	40
13	15	12	-3	0/3	0
14	13	16	+3	3/5	60
15	15	15	0	0/0	0
16	13	15	+2	3/4	75

Rank Order Correlation (Spearman's Rho) between columns 3 and 5 = .543
($P < .05$, $N = 16$)

The results of the Mid-Term Test as displayed in Table 3 and in Figure 4 suggest that tutors were not effective with respect to the blending outcomes (Outcomes 4a and 4b). Several changes were installed to correct this deficiency. The specifications for the Practice Exercises dealing with blending were changed beginning with Unit 6 so that pupils received practice more appropriate to the objective. Also, the observational data (see footnote 1, page 2) on the tutors suggested that they were inadequately trained to work with this outcome. A training tape was designed to overcome this deficiency. This tape and related materials were used by the kindergarten teachers with tutors as part of a midyear retraining session.

Another midyear modification was installed in the four tutorial schools. Tutors employed contingency management techniques in conjunction with the Tutor Record Cards. If a student did as well, or better, on Trial 2 as on Trial 1, then he received a "special envelope" containing a "Good Work" badge or other reinforcer. Tutors, in turn, seemed reinforced by their students' improved performance.

Final pupil performance data as well as other program outcomes will be compiled and made available in summer of 1969 in a SWRL Technical Report. The Technical Report will also contain detailed accounts of the tutor training procedures and program installation procedures.